CMPT481 Project Report

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PROBLEM AND MOTIVATION

In 1980, the ratio for debt-to-income in Canada is 661 At a young age Canadians are taught how to count and spend money but we are not all taught how to budget effectively. Whether you are a businessowner, student, or bringing home the bacon for your family; it is important to budget. Budgeting allows a person to determine if they will have enough money for what they need to do and what they would like to do. The reason people might fall in to debt is the fact that they are spending more than they expected. If a person was to set aside a predetermined amount of money that they wish to spend each week or month and could better visualize their spending habits in relation to their saving. This will allow them to better prioritize their budget and find areas to increase savings.

It can be easy to forget to add expenses as they occur throughout the day. Reasons for this may include that the method of inputting their expenses is too time-consuming or difficult to use; or that their budgeting application is not available on their mobile device. Many of the current applications that are purposed towards tracking weekly or monthly recreational budgets (non re-occurring bills and expenses) are not easy to use or engaging for the user. Most visualization techniques present in other applications focus solely on the amount of money spent in each category, however this overlooks the primary purpose of budgeting and does not deliver the information of how the amount spent relates to the users savings goals. Many applications sacrifice ease-of-use by adding clutter for additional (often unused) features. When navigating many of these applications it can seem that there is too much going on. Accessibility of the application can also be an issue, disparity in interface between the Desktop and mobile versions can be a confusing experience. Some applications are not available on all devices.

RELATED LITERATURE AND BACKGROUND

DESCRIPTION OF THE SYSTEM

Initial Prototype

The intention was to build an application that was as easy to use as possible, users should be able to jump right into the tasks without prior training and be able to complete them confidently and successfully. The easiest way to accomplish this was to minify the scope of the application to its simplest possible subset. Minimizing the number of actions available simplifies the interface and allows the user to navigate confidently.

In the initial "Wizard of Oz" style paper prototype the interface was pared down to only 3 screens, one for each of the tasks users are allowed to perform:

- Add an expense
- View expenses
- Customize budget allowances

As with any design process it was quickly discovered during trials that it was unclear how to perform certain actions; for instance there was no functionality for cancelling or removing an expense. Each hiccup was noted and changes were prioritized for the next prototyping stage.

Adjustments

The next prototype was constructed as a fully interactive and functional web application using Javascript, html and CSS. This allowed us to implement the functionality which was missing from our paper prototypes such as animations, calculations, and the use of real data.

A critical analysis was performed on the data collected from the paper-prototype trials. This inspired a focus on displaying the information available as clearly as possible. Naturally the implementation met some obstacles and decisions were made to cut or work around some features. Features which were cut or altered include:

- Saving data across sessions
- Cancelling expenses
- Viewing individual expenses
- Cancel buttons/back buttons
- Adding additional expense categories

Many features were determined to be "nice to have" but not crucial for the testing stage of this level of prototype. These concerns are addressed again in the retrospective portion of the report.

Overall the choice of web technologies suited the implementation well; particularly the ability to use the same prototype on mobile and desktop. A familiarity with React and Redux allowed quick bug-free edits when concerns regarding functionality or layout were raised.

The use of Redux specifically simplified the problem of syncing data across the application trivial. These choices were made within a forward thinking context, if the application were to move forward to large scale deployment the code may progress towards that goal.

One of the greatest difficulties faced was that of creating a responsive layout that allowed code re-use across Mobile and Desktop devices. The preference was for the interfaces to be similar enough to allow habits formed on one device to transfer to the other. To this end CSS media-query rules were used extensively alongside the responsive CSS framework Bulma.io. Google Chrome's developer tools were instrumental in testing the interface on multiple mobile devices.

Another challenge was the limited screen real-estate on mobile devices. Navigation items needed to be accessible without getting in the way. Additional complexity was added to the application to hide and show certain screens since there is not enough room on a mobile device for all screens to be showing at the same time.

Retrospective

As expected, user testing of the interactive prototype was very revealing of yet more flaws, but also of successes in our design.

The application failed to account for the change in idioms between mobile and desktop, i.e. users tried to edit categories or add expenses by touching interface elements. Most users mentioned that they would like more functionality, many of the requested features were originally part our the design but were left out due to time constraints, cluttering of the interface, or implementation difficulties.

It seemed that the most difficulty was encountered in navigation between features and the discoverability of functionality. This suggests that this is an area of potentially large benefit with lower amounts of work.

Some requested features were deliberately left out. For instance one user mentioned that they prefer that their budgeting app links to their bank account and tracks their expenses automatically. Not only was this out of scope for the time-frame of the project, but it is also contrary to the design principles of being as simple as possible. Several other features would be rejected for the purposes of keeping the interface clean and simple.

EVALUATION WITH USER REPORTS

Goals, Approach and Rational for the Evaluation

Goals

The primary goal of our project is for users to use our application to continuously track their expenses. It is our belief that if the application is made easy to use through an intuitive interface and navigation then the user will also be able to input expenses quickly and efficiently. If the user can quickly tell us how much they have spent in a specific category after expenses have been entered then it confirms that the application is presenting a clear visualization of the data. Unfortunately the continued use of the application can not be tested within the scope of this class since that would require multiple interviews with the test users to evaluate their usage and a high-fidelity prototype.

Approach and Rational for the Evaluation

We will use interviews to evaluate our goals. Seeking to determine what they require to make their budgeting experience with our app the most enjoyable.

Actual Participant Pool and Other Execution Details

We had used a mixture of family/friends for our test cases.

User 1 An individual who has limited experience with computers.

User 2 An individual who has a degree in computer science and may offer some valuable criticisms.

User 3 Older demographic who may have budgeted using other methods in the past.

User 4 A business student who has studied budgeting.

Divergence from Milestone III Evaluation Plan

Upon implementing our Medium Fidelity-Prototype our task list had diverged from what we initially said our application would be able to do. Instead of only three tasks that would be able to be performed, the application can now perform five different tasks:

- Add an expense (unchanged)
- View expenses over a weeks/months/years time (unchanged)
- Change an overall budget (unchanged)
- Change a category name
- Set a budget limit for one or all categories

We had also said that our redesign would offer cancellation of actions to improve user experiense, however we did not include a cancellation option in our "Add Expense" page for the mobile interface.

Results

While examining the results from the interviews it was clear that there were both positive and negative themes. The users appeared to have a preconceived notion on how our application should work from applications they had used in the past, even apps unrelated to budgeting. Due to this knowledge transfer it had caused both positive and negative feedback.

Some common positive themes shared amongst the users were:

- Similar interfaces between mobile and desktop
- Easy and quick to add expenses

- Nice animations

Where once the user had learned how to use the application the fact that the desktop and mobile interfaces were so similar, it allowed users to switch between the two with minimal confusion. The animations engaged the users when they had added expenses into the application.

Negative Themes

- It should be more customizable
  - Pick default view
  - Have more categories
- More indepth data
- Have the ability to click the label or the bar for the category to be able to edit the name of the category or view more data

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User #2 as expected went above and beyond when supplying feedback. They had mentioned for design ideas

Conclusion

The quality of our interface was quite positive and it met the goals that we had initially set out. The layout of the interface worked well, it was easy to use and users had very little trouble performing the tasks that we asked them to do. In general users wanted to be able to do more with the application such as add more categories and more closely track there spending. In this regard our application could use some more improvement but given our goal of a simple and quick interface, we achieved these goals. The testing that we performed showed all the users could quickly add expenses and found the graphs very easy to read. Many of the comments that users made were that they wanted more features but liked the features that we had implemented Our interface met the goals that we set out to achieve which is a quick and easy budgeting application.

FINAL RECOMMENDATIONS

The next step for our application would be to for some minor tweaks but the approach was valid. The tweaks would be to move a more complete interface. This would allow for more customizability and a better break down of the spending. We would also need to change the setting icon since this was confusing for some of the users. Once we made these small changes to the interface we could use the interface.

Reflection on design Process

- Did our design change as a result of user

Yes:

- Shifting layout of interface - Mobile: change main page to be add-expense screen - Move and add label for Settings button. - Label any 'icons' with text - Users want more customizability - Users wanted the features we hadn't implemented - Track individual expenses - Change orientation of graphs - Add cancel buttons - Make it more intuitive for a touch interface (users touched labels)

Stop now, go back to where you were 12 weeks ago, and decide whether anything has changed in your perspective. - People think they want more functionality than we think they need.

What have you learned about the user-centered design process, over the course of the entire project?

- Should have run more trials at lower fidelity - Users are dumber in some ways and smarter in others - It's useful - It's easier to get negative feedback rather than positive.

Did it work for you?

- Yes, we learned and were able to use user's feedback for the better

Did the methods you chose for your evaluation and prototyping get at what you were looking for? - Yes, the interview was a good process, the medium fidelity worked well. - The Low fidelity could have been done better/replaced with something else

In hindsight, would a different approach have been better?

- For low fidelity it would have been useful to do a more interactive and comprehensive prototype like axure or even more advanced paper prototypes with colours and shapes.

What were the most, and least, valuable among the activities weve asked you to try out, either generally or specifically for your project?

- Most valuable was conducting guided interviews, these prompted lots of useful feedback from users. - Low fidelity prototyping was useful in general, we re-architected our design and approach several times as a result - 10x10 design was useful

- Time could have been shifted to allow more time for higher-fidelity testing and user engagement.

Having gone through this course, how might you approach your next interface design project (whether for fun/personal or work, large or small) differently?

- Spend more time on design and planning before jumping in. - Get more people to test it out rather than just myself. - Interview testers and users with probing questions rather than just asking "what do you think"

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APPENDICES

A1 - Evaluation Instrument

Tasks we got the users to perform

- Add different expenses to two or three different categories
- After adding expenses, (go to screen) for data visualization
- Change the name of a category
- Change the overall budget limit (it will originally be set to 200$)
- Change one category limit
- Add more expenses to that category and get it to go over the budget limit

Pre-Demos

- Do you currently or have you ever budget(ed)?
  - (Yes - Probing Question) What method do you use?
  - (No - Probing Question) Is there a specific reason why?

Post Desktop Demo

- Was there anything thing that you found counter intuitive?
- If you could change/add things about the app, what would it be? (From desktop perspective)

Post Mobile Demo

- Was there anything thing that you found counter intuitive?
- If you could change/add things about the app, what would it be? (From mobile perspective)

Post-Demos

- How did you find the mobile interface versus the desktop interface?
  - (Probing Question) Which was easiest to use?
  - (Probing Question) For you what made the data more visually clear for you?
- (If they had budgeted previously) If you had tried using other budgeting apps before, how did ours compare?
  - (Yes - Probing Question) What app allowed you fast input?
  - (Yes - Probing Question) What app allowed more accurate input?
  - (Yes - Probing Question) Are you more likely to continue using ours or the other one?
  - (No - Probing Question) Why?
- (If they had not budgeted before) After testing this app, would you be likely to continue using it consistently?